



Optimal Solutions for the Future

VC 630/5AX



**Simultaneous
5-axis Vertical
Machining Center**

VC 630/5AX

VC 630/5AX

VC 630/5AX with APC

ver. EN 151208 SU

Product Overview

Basic Information

Basic Structure
Cutting
Performance

Detailed Information

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VC 630/5AX

The VC630 5AX machining center provides full 5 axis simultaneous machining capability. It's highly rigid integral rotary/tilt table and high precision built in spindle provide the solution for both high speed and heavy duty machining of complex parts in one setting.



The highly rigid structure designed by the simulation techniques, and responsive axis feed system provide world class precision machining capability.

The high performance spindle motor ensures optimum machining performance at high speed and heavy duty cutting.

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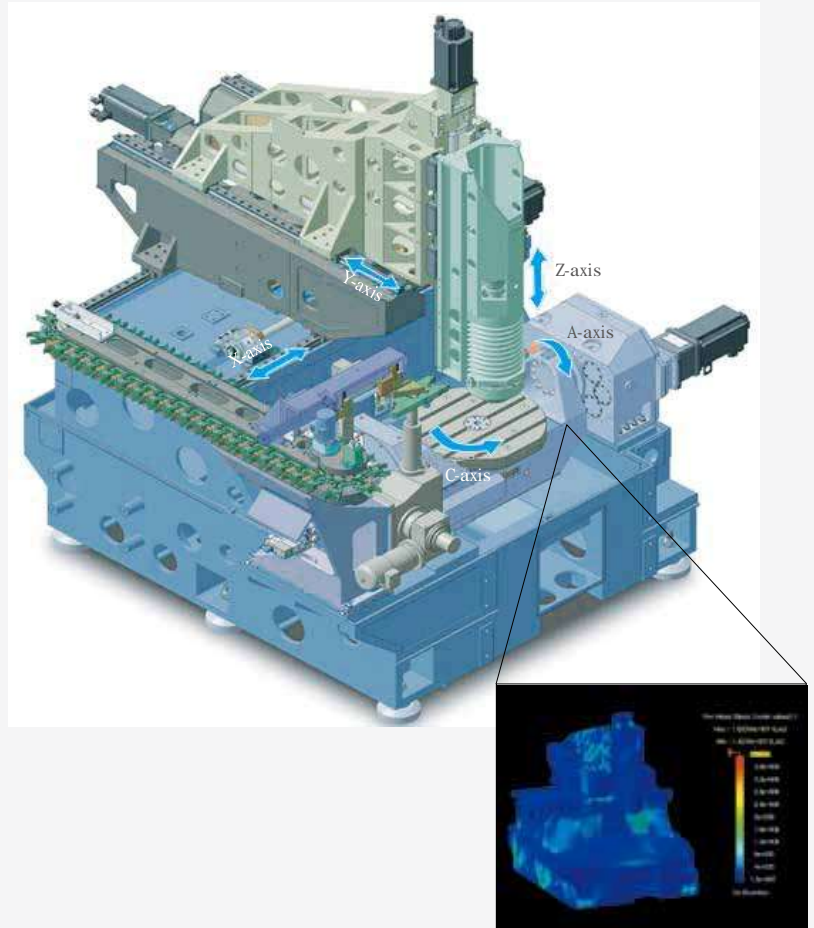
Higher Machining Accuracy

For higher accuracy, we provide the thermal displacement compensation system even during a prolonged period of machining and high-rigidity machine structure.

High rigidity machine structure results in optimum static and dynamic rigidity verified by 3D simulation, resulting in highly stable precision machining.

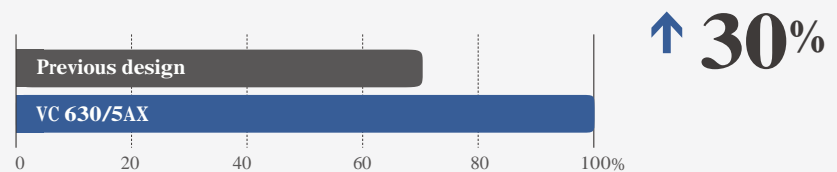
High-Rigidity Design and Structure

Machine structure is designed by Finite Element Analysis Method (FEM) and the static/dynamic rigidity is further enhanced.



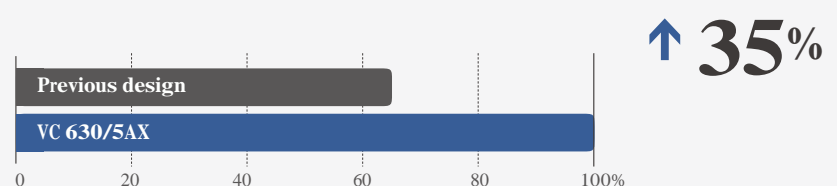
Static Rigidity

The static rigidity structure of the VC630/5AX has been increased by 30% through the FEM analysis.



Dynamic Rigidity

FEM analysis was also used to improve the frequency response and vibration damping property by 35% over the previous design.





Axis Feed System

High-Rigidity Axis Feed System

The axis feed system structure is designed to achieve the combination of high rigidity and responsive feed motion. The base casting is made of heavy duty Meehanite Cast Iron which provides excellent vibration damping characteristics and guarantees highly stable machining conditions. Roller type linear guideways and highly rigid couplings are included to provide both rigidity and sensitive X,Y,Z axis feed. Ballscrew nut cooling reduces heat generation to minimise thermal displacement.

High-rigidity roller type guideway

proved

Roller type li

with roller type guideway and coupling.

Ball screw nut cooling

Rigid Coupling

Oil Cooler

VC 630/5AX

Division	Unit	X-axis	Y-axis	Z-axis
Travels	mm (inch)	650 (25.6)	765 (30.1)	520 (20.5)
Rapid travers	m/min (ipm)	40 (1574.8)	40 (1574.8)	36 (1417.3)

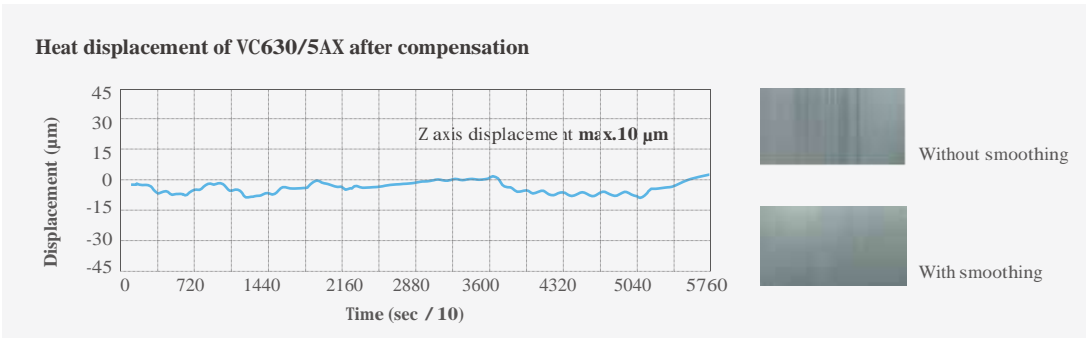
Linear scale option

All axes are equipped with the linear scale as a optional feature to maintain the highest degree of accuracy over many hours of operation.



Thermal Error Compensation

live data is collected from multiple temperature sensors around the machine are combined with Doosan feed system smoothing algorithms to provide real time thermal compensation and provide optimum precision.



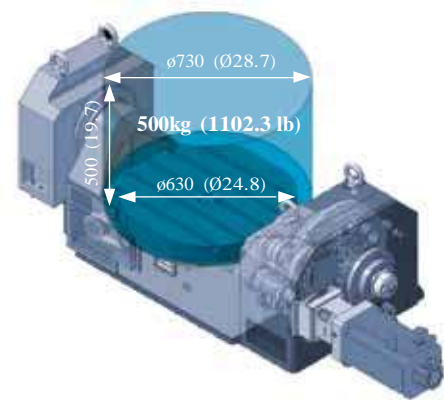
Rotary Table

Large workpiece capacity allows a variety of parts to be machined in one set up.

Max. Workpiece Size and Weight

Max. size
ø730 x 500mm
(Ø28.7 x 19.7 inch)

Max. weight
500kg
(1102.3 lb)



Wider Machining Area

A wide machining area allows access to machine many features of large workpieces.

Y stroke 765 (30.1)
450 (17.7) 315 (12.4)

50 (1.97)
Max. Workpiece 500 (19.7)

Stroke			
Division		A-axis	C-axis
VC 630/5AX	Travels (deg)	+30 ~ -120	360
	Rapid traverse (r/min)	20	30

Automatic Pallet Changer (APC) option

The automatic pallet changer allows setting the workpiece even during the machining process to further improve productivity.

Pallet size	500 x 500 mm (19.7 x
Max. workpiece swing (D x H)	ø 730 x 450 mm (Ø28.7
Table loading capacity	500 kg (1102.3 lb)
APC Change time	30 s



Tool Changer

Along with the rapid tool change that enables higher productivity, a wide range of choices is available for tool magazines.

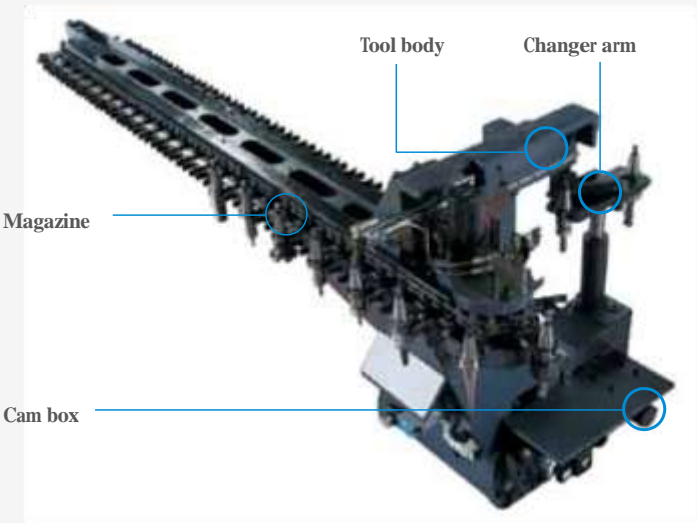
Automatic Tool Changer

Tool change time

1.0s

40 tools CAM Type ATC

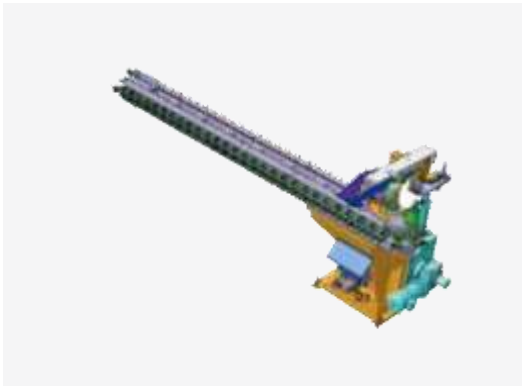
(60, 81, 101, 121 tool) **option**



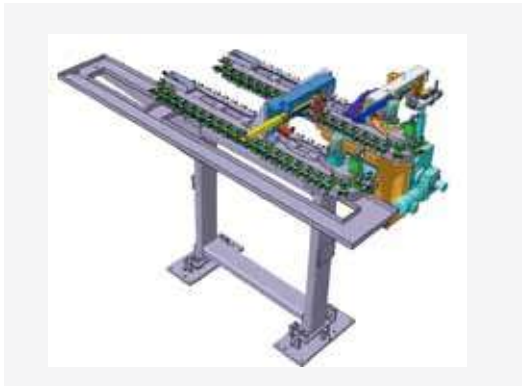
High-Capacity Magazines **option**

A wide range of tool magazine choices (60 / 81 / 101 / 121 tools magazines) is available. The Increased tool capacity will improve user convenience and efficiency.

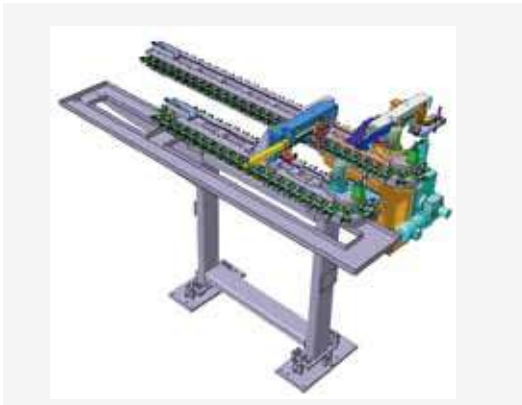
60 Tools



81 Tools



101 Tools



121 Tools



Spindle

Built-in motor
minimizes vibration
and noise generated.

Built-in Spindle

The main spindle is optimally designed with 4 row precision ceramic bearing whose features, low centrifugal force and minimum heat generation, are great merits at high speed condition. The high productivity is realized by reduction of the acceleration time to the maximum speed of main spindle.



Spindle Motor

Spindle Motor Power Output (30min/cont. : 12000 r/min)

FANUC

22/18.5 kW
(29.5/24.8 Hp)

HEIDENHAIN

23.5/18 kW
(31.5/24.2 Hp)

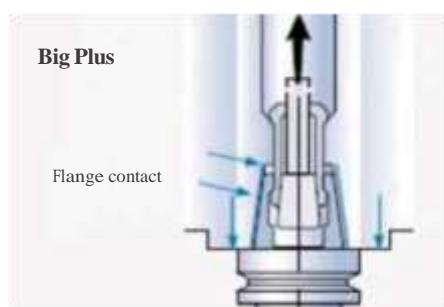
SIEMENS

30/24 kW
(40.3/32.2 Hp)



Dual Contact Spindle

Dual contact spindle is adopted to improve spindle life and surface roughness in high-speed cutting process.





Cutting Performance

From high-speed machining to heavy-duty cutting, diverse machining processes are applicable for complex-shaped workpiece.

Machining Performance

Max. chip throughput

Item	Material		Condition (SM45C, AL6061 same)
	SM45C	AL6061	
Machining removal rate	739.2 cm^3/min	2688 cm^3/min	Ø80mm (3.15 in.) Face Mill (6Z)
Feed rate	3300 mm/min (130 ipm)	7000 mm/min (275.8 ipm)	
Depth	2.5 mm (0.1 inch)	2.5 mm (0.1 inch)	
Width	64 mm (2.5 inch)	64 mm (2.5 inch)	

Max. / min. tapping capabilities

Item	Material	
	SM45C	AL6061
Tool size	M42 x P4.5	M3 x P0.5
Feed rate	675 mm/min (26.6 ipm)	1800 mm/min (70.9 ipm)

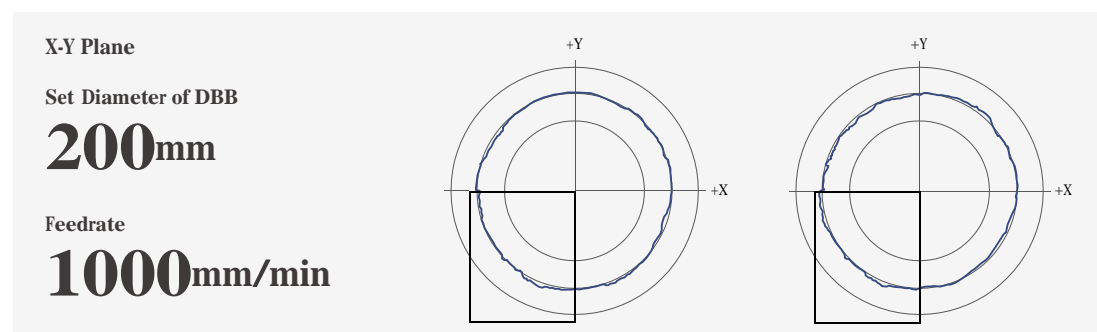
* The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Machining Examples

Tire Mold		
Workpiece size	400 x 400 x 150 mm (15.7 x 15.7 x 5.9 inch)	
Material	Wood plastic	
Mold Package	332 Tuning Cycle (Heidenhain Itnc530)	
Cutting	Finish	
Tool	ø0.8mm Ball EM	
Spindle speed	24000 r/min	
Feed rate	400 mm/min (15.7 ipm)	
Hinge Fitting		
Workpiece size	270 x 138 x 90 mm (10.6 x 5.4 x 3.5 inch)	
Material	AL7075	
Mold Package	DSQ 1	
Cutting	Finish	
Tool	ø12 mm Ball EM	
Spindle speed	12000 r/min	
Feed rate	1000 mm/min (39.4 ipm)	
Impeller		
Workpiece size	D290 x 153 mm (D11.4 x 6 inch)	
Material	AL7075	
Mold Package	DSQ 3	
Cutting	Finish	
Tool	ø8 mm Ball EM	
Spindle speed	12000 r/min	
Feed rate	2500 mm/min (98.4 ipm)	

Ball Bar Measurement Test

Higher roundness accuracy is realized by the advanced design of machine structure and Doosan control system.



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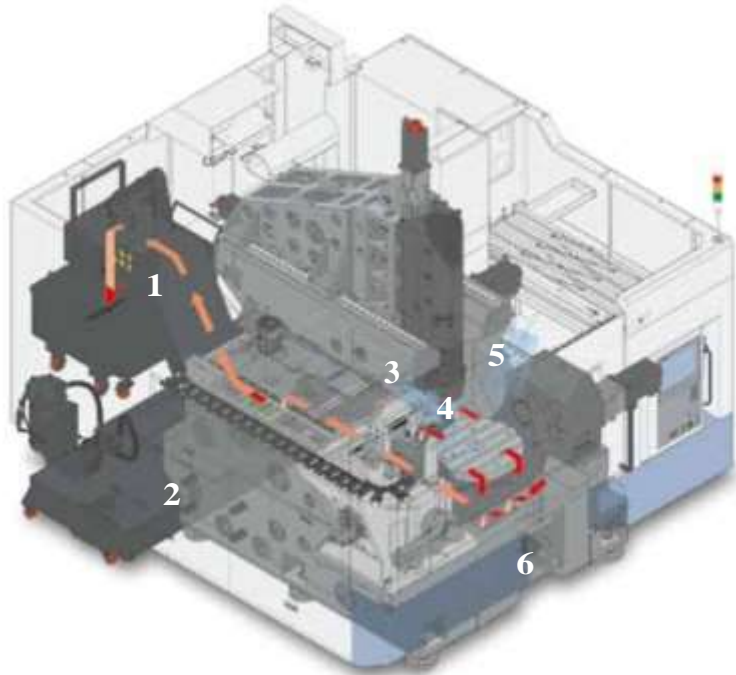
*More options will require consultation with Doosan.



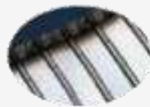
Optional Equipments

Convenience

Various optional equipments maximize the convenience and productivity.



1. Chip conveyor option



Hinge type



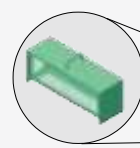
Scraper type



Drum filter type

2. Large capacity coolant tank built-in with chip pan and box filter

Coolant tank capacity 360L



Easier chip disposal with box-type filter

3. Shower coolant option

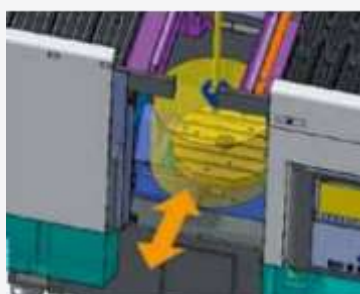


4. Coolant system



5. Auto-door type top cover

The top cover helps enhancing convenience when loading/unloading heavy workpiece on the processing table.



6. Internal screw conveyor





Convenient Operation

FANUC 31i-5

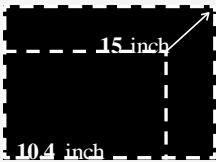
User convenience has been significantly enhanced with panel.

User-Friendly Operation Panel

Large 15inch screen and user-friendly operating function ensure convenient and efficient operation.



Large 15inch screen display



Design optimized for customers' needs based on extensive know-how

Designed for user convenience	Convenient and intuitive UI
	Optimized button size
	High-visibility lamps
	Long lifecycle buttons
Convenient option buttons	Partitioned to prevent operator error
	Detachable buttons
Customized functionality	Spare I/O signal ports for optional devices
	Customer-specific function switches
	Available for auxiliary panel design

Easy Operation Package

Setting up of tools, work pieces and programs, as well as troubleshooting for abnormal condition of main parts, is designed to minimize waiting time, maximize operational efficiency, and enhance operator convenience.



Adaptive Feed Control (AFC)
Function to control feedrate so that the cutting can be carried out at a constant load
(To adapt to the spindle load set up with constant load feedrate control function)



Tool Management
Function to manage tool information
[Tool information]
- Tool No.
- Tool condition : normal, large diameter, worn/damaged, used for the first time, manual
- Tool name



Tool Load Monitor
Function to automatically monitor tool load
(Different loads can be set for one tool according to M700 ~ M704)



Pattern Cycle (Engraving function : option)
Function to create frequently-used cutting programs automatically
- Pattern Cycle: creates a program for a pre-defined shape
- Engraving: creates a program for cutting a shape described with characters (option)



Work Offset Setting
Function to configure various work offset settings



Alarm Guidance
Function to show detailed info on frequently triggered alarms and recommended actions



Sensor Status Monitor
Function to view sensor conditions of the machine



ATC Recovery
Function to view detailed info with recommended actions and to perform step-by-step operation manually
(when an alarm is triggered during an ATC operation)

HEIDENHAIN iTNC530

Superior Hardware Specifications

15" LCD and capacious 21GB memory

15" LCD

15 inch

Description	HEIDENHAINiTNC530	Remarks
Screen size	15" STD	-
Storage memory	21GB STD	-
Interference prevention system	Optional	-
Kinematic OPT.	Optional	Measuring device not included
Look-ahead block	1024 blocks	-
3D line graphics	Std.	-

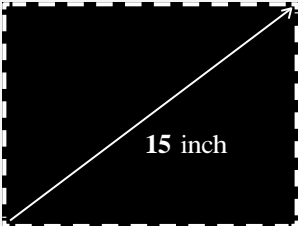
SIEMENS 840Dsl

Providing a perfect 5-axis machining environment

15-inch LCD and SINUMERIK Mdynamics 5-axis machining package (standard)



Large 15inch screen display

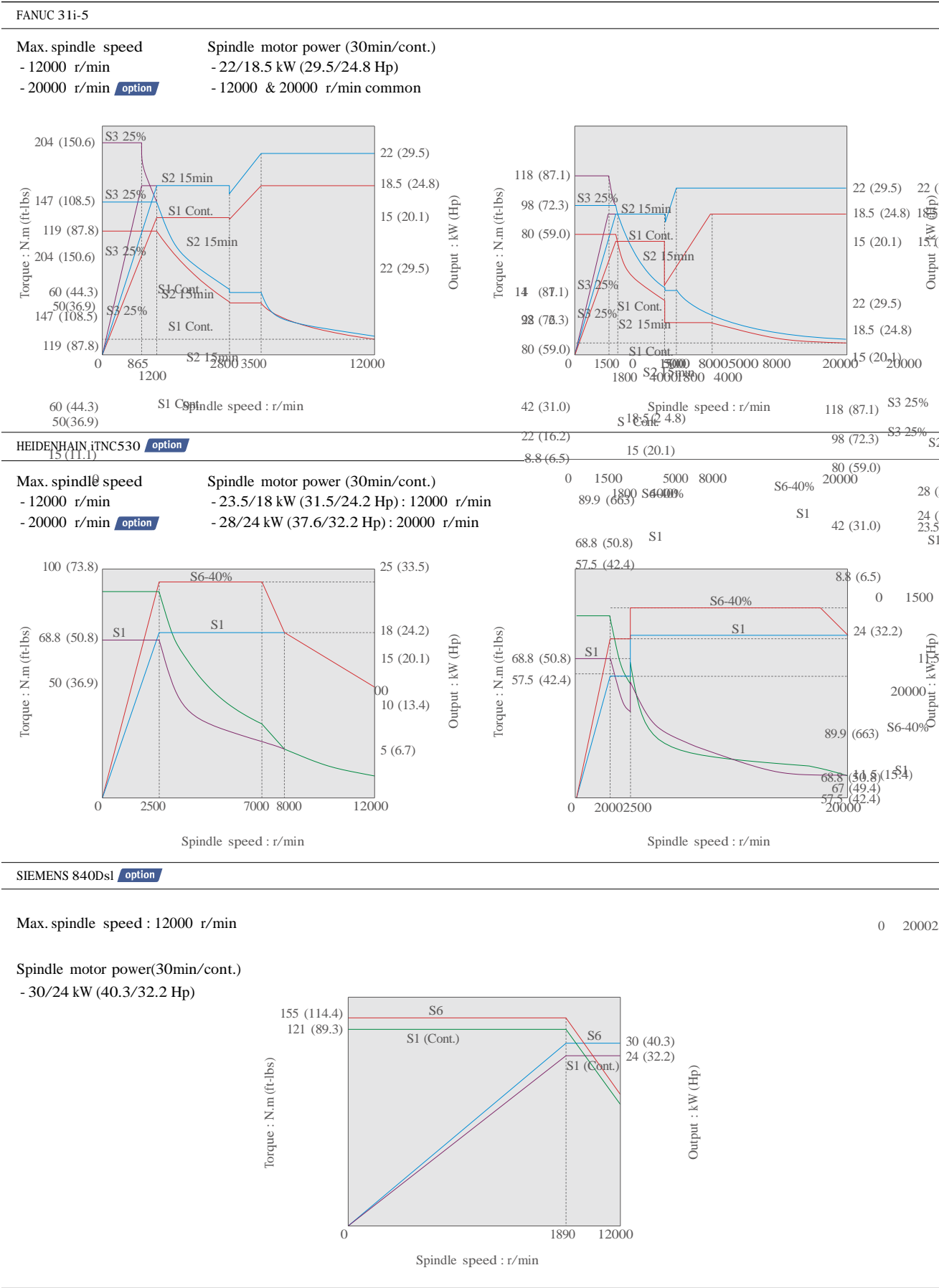


Mdynamics
5-axis machining
package

- Main features
- Advanced Surface
 - HMI user memory on CF-Card (min. 1GB program memory)
 - Automatic Measuring cycles functions
 - 3D simulation functions
 - Real-time simulation functions
 - ShopMill (an interactive machining support function)

Spindle

Spindle Power – Torque Curve

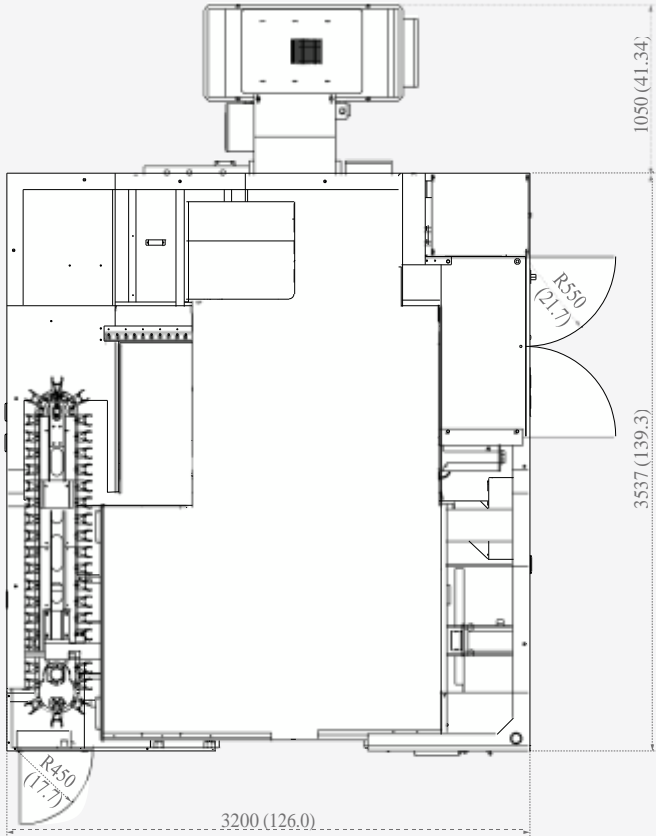


External Dimensions

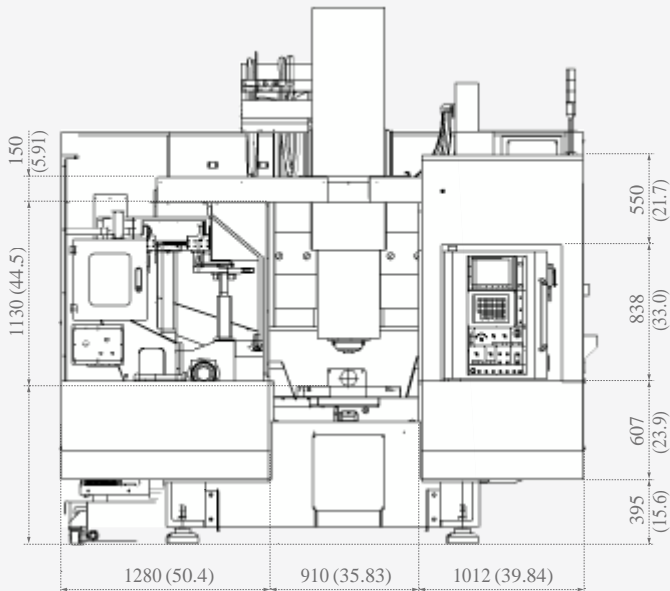
VC 630/5AX (Standard type)

Unit : mm (inch)

Top view



Front view

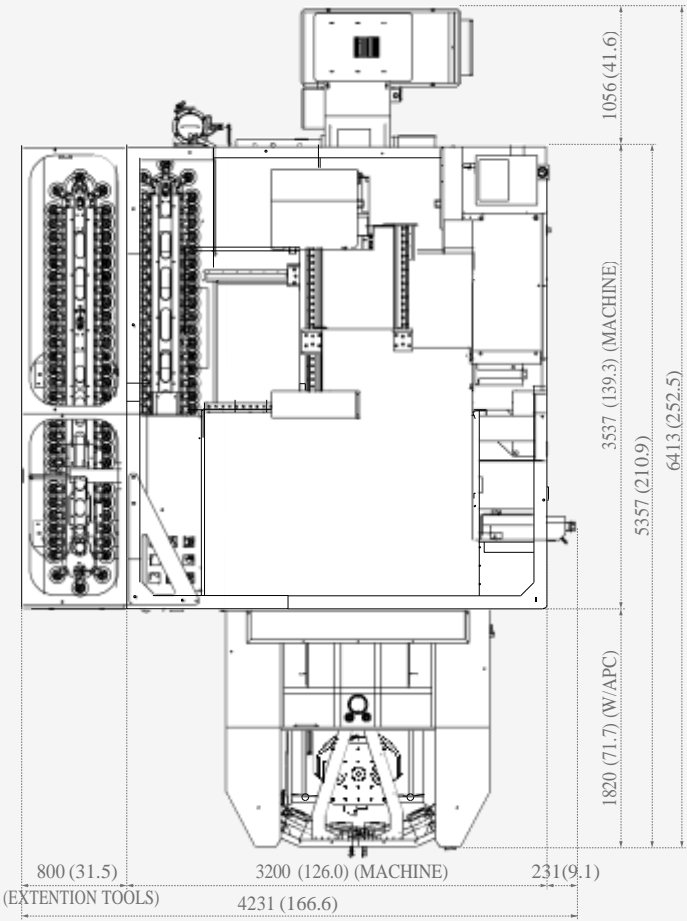


External Dimensions

VC 630/5AX (APC type)

Unit : mm (inch)

Top view



Front view

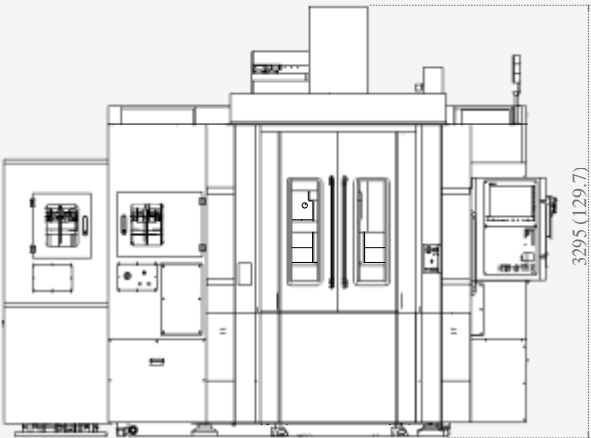
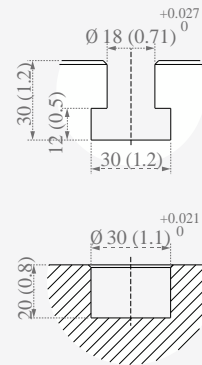
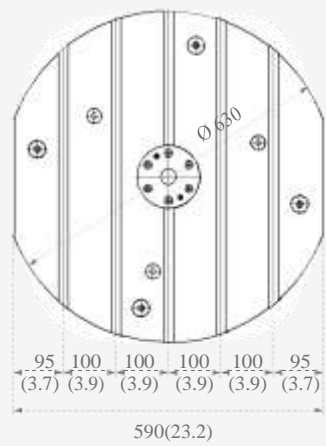


Table dimension / Tool shank

Table dimension

Standard type

Unit : mm (inch)



CLAMP(A)
(Optional) PT 1/4"

85
(3.3)

500 (19.7)
250 (9.8) 250 (9.8)
50 (2.0) 100 (3.9) 100 (3.9) 100 (3.9) 50 (2.0)

CLAMP(B)
(Optional)
PT 1/4"

50	100
(2.0)	(3.9)
	250 (9

APC type

Unit : mm (inch)

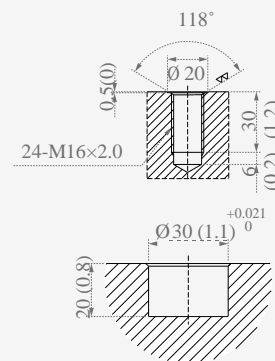
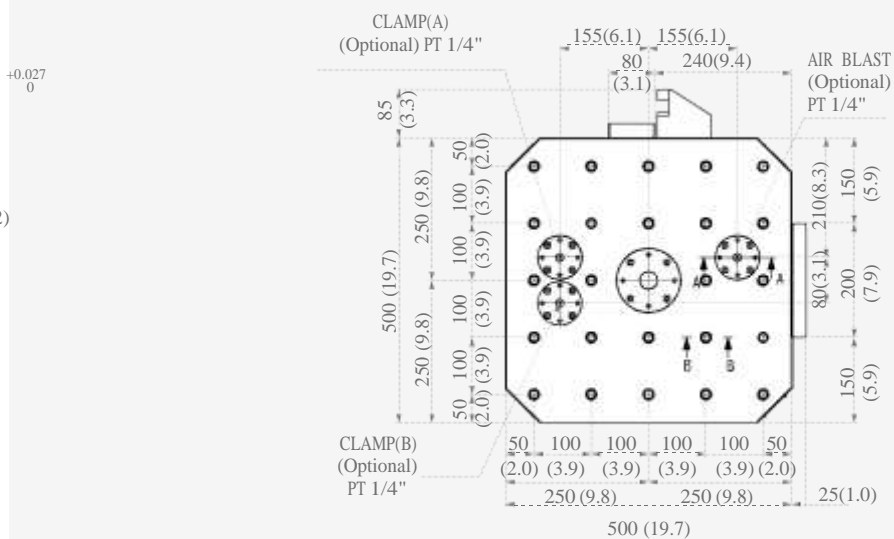


Table dimension / Tool shank

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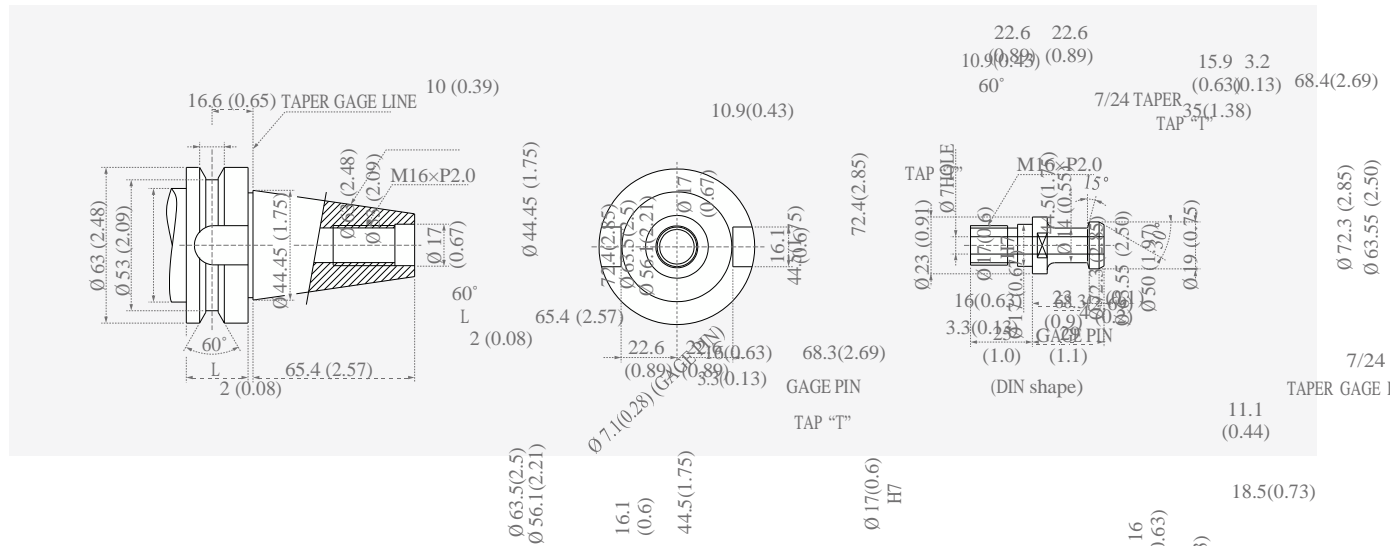
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Tool shank

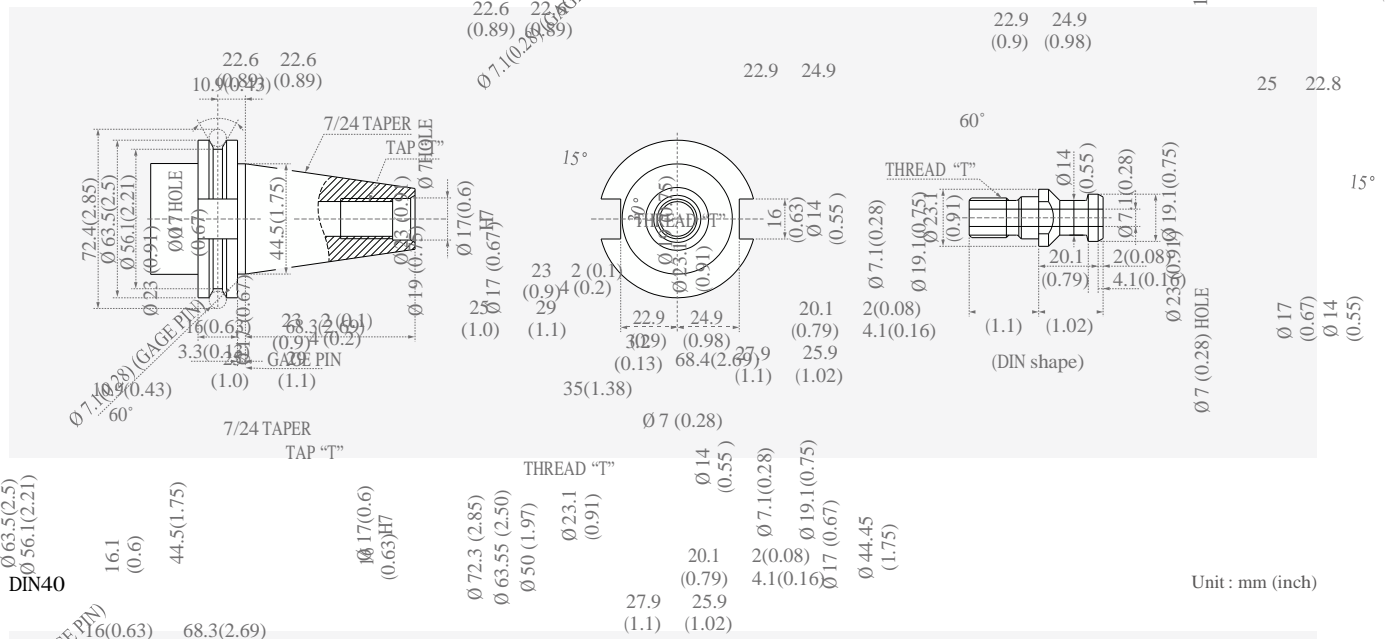
BT40

16.1
(0.6) Unit : mm (inch)

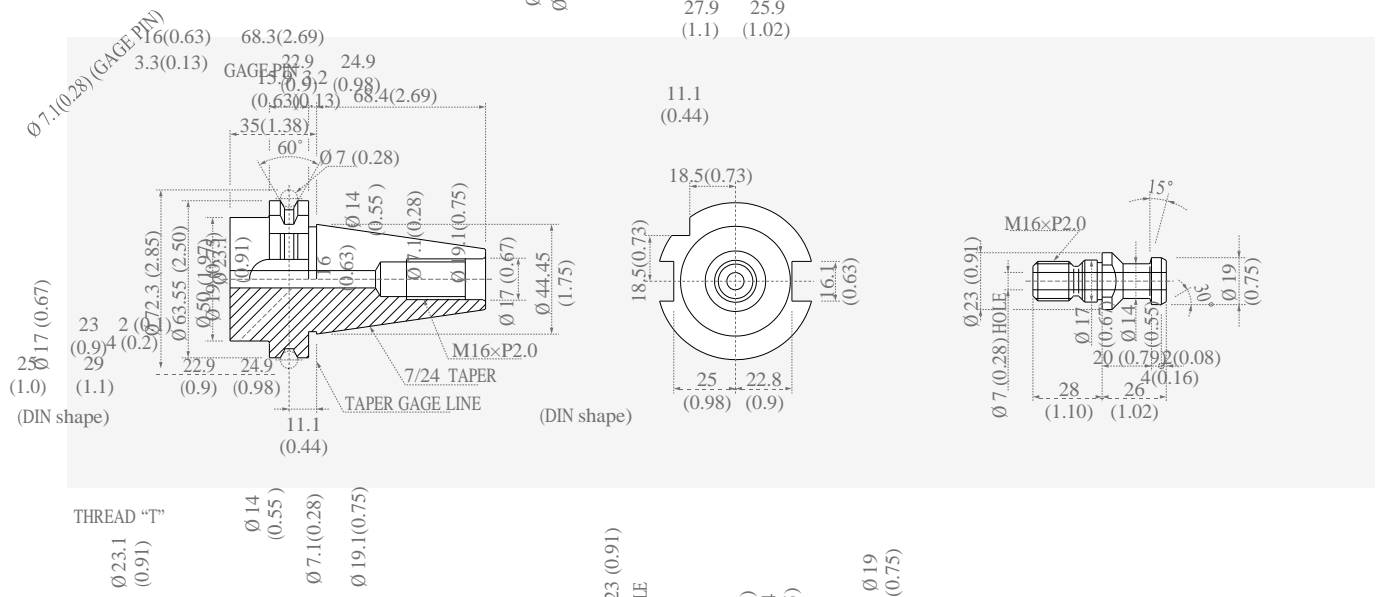


CAT40

Unit: mm (inch)



Unit : mm (inch)



Machine Specifications



Description		Unit	VC 630/5AX	VC 630/5AX with APC
Travels	X-axis	mm (inch)	650 (25.6)	
	Y-axis	mm (inch)	765 (30.1)	
	Z-axis	mm (inch)	520 (20.5)	
	A-axis	deg.	150 (+30~ -120)	
	C-axis	deg.	360	
	Distance from spindle nose to table top	mm (inch)	210 ~ 730 (8.3~28.7)	160 ~ 680 (6.3~26.8)
	Distance from spindle center to column guideway	mm (inch)	220 (8.7)	
Feedrate	Rapid traverse rate (X / Y / Z)	m/min (ipm)	40 / 40 / 36 (1574.8 / 1574.8 / 1417.3)	
	Rapid traverse rate (A / C)	r/min	20 / 30	
	Cutting feedrate (X / Y / Z)	mm/min (ipm)	18000 (708.7)	
	Cutting feedrate (A / C)	deg/min	7200	
Table	Table size	mm (inch)	ø 630 (24.8)	500 x 500 (19.7 x 19.7)
	Table loading capacity	kg (lb)	500 (1102.3)	
	Max. workpiece swing diameter x height	mm (inch)	ø 730 x 500 (28.7 x 19.7)	ø 730 x 450 (28.7 x 17.7)
	Minimum table indexing angle	-	0.001	
Spindle	Max. spindle speed	r/min	12000 [20000]	
	Spindle taper	-	ISO#40 7 / 24 Taper	
	Max. spindle torque	N.m (ft-lb)	204 (150.6) (25% ED)	
Automatic tool changer	Type of tool shank	-	MAS403 BT40	
	Tool storage capacity	ea	40 [60 / 81 / 101 / 121]	
	Max. tool diameter	mm (inch)	ø 80 (59.0)	
	Max. tool diameter without adjacent tools	mm (inch)	ø 125 (92.3)	
	Max. tool length	mm (inch)	300 (221.4)	
	Max. tool weight	kg (lb)	8 (17.6)	
	Method of tool selection	-	Fixed address	
	Tool change time (tool-to-tool)	s	1.0	
	Tool change time (chip-to-chip)	s	8.5	
Automatic pallet changer	Number of pallet	ea	-	2
	Type	-	-	Rotary shuttle
	Pallet change time	s	-	30
Motor	Spindle motor power	kW (Hp)	FANUC 31i-5 : 22/18.5 (29.5/24.8 Hp) {HEIDENHAIN iTNC 530 : 23.5/18(31.5/24.2 Hp), 12000 r/min / 28/24(37.6/32.2 Hp) : 20000 r/min} {SIEMENS 840 Dsl : 30/24(40.3/32.2 Hp)}	
Power source	Electric power supply	kVA	53.3	
	Compressed air supply	MPa	0.54	
Tank capacity	Coolant tank capacity	L (gallon)	360 (95.1)	
	Lubrication tank capacity	L (gallon)	1.32 (0.4)	
Machine Dimensions	Machine dimension (L x W x H)	mm (inch)	3537(4587 : with chip conveyor) x 3200 x 3295 (139.3(180.6 : with chip conveyor) x 126 x 129.7)	5357(with chip conveyor : 6413) x 4231 x 3295 (210.9(with chip conveyor : 252.5) x 166.6 x 129.7)
	Machine weight	kg (lb)	12500 (27557.4)	16000 (35273.4)
NC System			FANUC 31i-5 {DOOSAN FANUC i / HEIDENHAIN iTNC 530 / SIEMENS 840 Dsl}	

* [] : Option

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NC Unit Specifications



Standard Optional X N/A

NO.	Description		Spec.	DOOSAN-FANUC i	FANUC 31i-5
1	AXES CONTROL	Controlled axes	3 (X, Y, Z)	X, Y, Z, B, (5)	X, Y, Z, B, (5)
2		Additional controlled axes	5 axes in total		
3		Least command increment	0.001 mm / 0.0001"		
4		Least input increment	0.001 mm / 0.0001"		
5		Interpolation type pitch error compensation			
6	INTERPOLATION & FEED FUNCTION	2nd reference point return	G30		
7		3rd / 4th reference return			
8		Inverse time feed			
9		Cylindrical interpolation	G07.1		
10		Helical interpolation B	Only Fanuc 30i	-	
11		Smooth interpolation		-	
12		NURBS interpolation		-	
13		Involute interpolation		-	
14		Helical involute interpolation		-	
15		Bell-type acceleration/deceleration before look ahead interpolation			
16		Smooth backlash compensation			
17		Automatic corner override	G62		
18		Manual handle feed	Max. 3unit	1 unit	1 unit
19		Manual handle feed rate	x1, x10, x100 (per pulse)		
20		Handle interruption			
21		Manual handle retrace			
22		Manual handle feed 2/3 unit		-	
23		Nano smoothing	AI contour control II is required.		
24		AI APC	20 BLOCK	X	X
25		AICC I	30 BLOCK	X	X
26		AICC I	40 BLOCK	X	X
27		AICC II	200 BLOCK		
28		AICC II	400 BLOCK	-	
29		High-speed processing	600 BLOCK	-	
30		Look-ahead blocks expansion	1000 BLOCK	-	
31		DSQ I	AICC II (200block) + Machining condition selection function	-	
32		DSQ II	AICC II (200block) + Machining condition selection function + Data server (1GB)	-	
33		DSQ III	AICC II with high speed processing (600block) + Machining condition selection function + Data server(1GB)	-	
34	SPINDLE & M-CODE FUNCTION	M- code function			
35		Retraction for rigid tapping			
36		Rigid tapping	G84, G74		
37	TOOL FUNCTION	Number of tool offsets	64 ea	-	64 ea
38		Number of tool offsets	99 ea	-	
39		Number of tool offsets	200 ea	-	
40		Number of tool offsets	400 ea	400 ea	
41		Number of tool offsets	499 / 999 / 2000 ea	-	
42		Tool nose radius compensation	G40, G41, G42		
43		Tool length compensation	G43, G44, G49		
44		Tool life management			
45		Addition of tool pairs for tool life management			
46		Tool offset	G45 - G48		

NC Unit Specifications

☂Standard ☂Optional X N/A

FANUC

NO.	Description	Spec.	DOOSAN-FANUC i	FANUC 31i-5
47	Custom macro		☂	☂
48	Macro executor		☂	☂
49	Extended part program editing		☂	☂
50	Part program storage	256KB (640m)	-	640m
51	Part program storage	512KB (1,280m)	1280m	☂
52	Part program storage	1MB (2,560m)	-	☂
53	Part program storage	2MB (5,120m)	☂	☂
54	Part program storage	4MB (1,0240m)	-	☂
55	Part program storage	8MB (2,0480m)	-	☂
56	PROGRAMMING & EDITING FUNCTION	Inch/metric conversion	G20 / G21	☂
57		Number of Registered programs	400 ea	400 ea
58		Number of Registered programs	500 ea	-
59		Number of Registered programs	1000 ea	500 ea
60		Number of Registered programs	4000 ea	-
61		Optional block skip	9 BLOCK	☂
62		Optional stop	M01	☂
63		Program file name	32 characters	-
64		Program number	O4-digits	☂
65		Playback function		☂
66		Addition of workpiece coordinate system	G54.1 P1 - 48 (48 pairs)	48 pairs
67		Addition of workpiece coordinate system	G54.1 P1 - 300 (300 pairs)	48 pairs
68		Embedded Ethernet	☂	☂
69		Graphic display	Tool path drawing	☂
70		Loadmeter display	☂	☂
71		Memory card interface	☂	☂
72		USB memory interface	Only Data Read & Write	☂
73		Operation history display	☂	☂
74		DNC operation with memory card	☂	☂
75		Optional angle chamfering / corner R	☂	☂
76		Run hour and part number display	☂	☂
77		High speed skip function	☂	☂
78		Polar coordinate command	G15 / G16	☂
79		Polar coordinate interpolation	G12.1 / G13.1	-
80		Programmable mirror image	G50.1 / G51.1	☂
81		Scaling	G50, G51	☂
82		Single direction positioning	G60	☂
83		Pattern data input	☂	☂
84		Jerk control	AI contour control II is required.	☂
85		Fast Data server with 1GB PCMCIA card	☂	☂
86		Fast Ethernet	☂	☂
87		3-dimensional coordinate conversion	☂	☂
88		3-dimensional tool compensation	-	☂
89		Figure copying	G72.1, G72.2	-
90		Machining time stamp function	-	☂
91		EZ Guide I with 10.4" Color TFT	Doosan infracore Conversational Programming Solution - When the EZ Guide i is used, the Dynamic graphic display cannot application	☂
92		Dynamic graphic display (with 10.4" Color TFT LCD)	- Machining profile drawing. - When the EZ Guide i is used, the Dynamic graphic display cannot application	☂








































NC Unit Specifications



Standard Optional X N/A

No.	Description		Spec.	iTNC 530
1	Axes	Controlled axes	5 axes	X, Y, Z, C, A
2			Max. 18 axes in total	
3		Least command increment	0.0001 mm (0.0001 inch), 0.0001°	
4		Least input increment	0.0001 mm (0.0001 inch), 0.0001°	
5		Maximum commandable value	±99999.999mm (±3937 inch)	
6		Axis feedback control	Double-speed control loops for high-frequency spindles and torque/linear motors	
7		MDI / DISPLAY unit	15.1 inch TFT color flat panel	
8			19 inch TFT color flat panel	
9		Program memory for NC programs	SSDR	21GB
10		Block processing time		0.5 ms
11		Cycle time for path interpolation	CC 61xx	3 ms
12		Encoders	Absolute encoders	EnDat 2.2
13	Commissioning and diagnostics	Data interfaces	Ethernet interface	
14			USB interface (USB 2.0)	
15	Machine functions	Look-ahead	Intelligent path control by calculating the path speed ahead of time (max. 1024 blocks.)	
16		HSC filters		
17		Switching the traverse ranges		
18	User functions	Program input	According to ISO	
19			With smarT.NC	
20		Position entry	Nominal positions for lines and arcs in Cartesian coordinates	
21			Incremental or absolute dimensions	
22			Display and entry in mm or inches	
23			Display of the handwheel path during machining with handwheel superimpositioning	
24			Paraxial positioning blocks	
25		Tool compensation	In the working plane and tool length	
26			Radius-compensated contour lookahead for up to 99 blocks (M120)	
27			Three-dimensional tool radius compensation	
28		Tool table	Central storage of tool data	
29			Multiple tool tables with any number of tools	
30		Cutting-data table	Calculation of spindle speed and feed rate based on stored tables	
31		Constant contouring speed	relative to the path of the tool center or to the tool's cutting edge	
32		Parallel operation	Creation of a program while another program is being run	
33		Tilting the working plane with Cycle 19		
34		Tilting the working plane with the PLANE function		
35		Manual traverse in tool-axis direction	after interruption of program run	
36		Function TCPM	Retaining the position of tool tip when positioning tilting axes	
37		Rotary table machining	Programming of cylindrical contours as if in two axes	
38			Feed rate in distance per minute	
39		FK free contour programming	for workpieces not dimensioned for NC programming	
40		Program jumps	Subprograms and program section repeats	
41			Calling any program as a subprogram	
42		Program verification graphics	Plan view, view in three planes, 3-D view	
43		Programming graphics	3-D line graphics	
44		Program-run graphics	(plan view, view in three planes, 3-D view)	

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No.	Description		Spec.	iTNC 530
45	User functions	Datum tables	Saving of workpiece-specific datums	
46		Preset table	Saving of reference points	
47		Freely definable table	after interruption of program run	
48		Returning to the contour	With mid-program startup	
49			After program interruption (with the GOTO key)	
50		Autostart		
51		Actual position capture		
52		Enhanced file management		
53		Context-sensitive help for error messages		
54		TNCguide	Browser-based, context-sensitive helpsystem	
55		Calculator		
56		Entry of text and special characters		
57		Comment blocks in NC program		
58		"Save As" function		
59		Structure blocks in NC program		
60		Entry of feed rates	FU (feed per revolution)	
61			FZ (tooth feed per revolution)	
62			FT (time in seconds for path)	
63			FMAXT (only for rapid traverse pot: time in seconds for path)	
64		Dynamic collision monitoring (DCM)		
65		Fixture monitoring		
66		Processing DXF data		
67		Global program settings (GS)		
68		Adaptive feed control (AFC)		
69		KinematicsOpt	Automatic measurement and optimization of machine kinematics	
70		KinematicsComp	Three-dimensional compensation	
71		3D-ToolComp	Dynamic 3-D tool radius compensation	
72	Fixed cycles	Working plane	Cycle 19	
73		Cylinder surface	Cycle 27	
74		Cylinder surface slot milling	Cycle 28	
75		Cylinder surface ridge milling	Cycle 29	
76	Cycles for automatic workpiece inspection	Calibrate TS		
77		Calibrate TS length		
78		Measure axis shift		
79		Save kinematics		
80		Measure kinematics		
81		Preset compensation		
82	Options	Software option 1		
83		- Rotary table machining	Programming of cylindrical contours as if in two axes	
84			Feed rate in mm/min	
85		- Coordinate transformation	Tilting the working plane, PLANE function	
86		- Interpolation	Circular in 3 axes with tilted working plane	
87		Software option 2		
88		- 3-D machining	3-D tool compensation through surface normal vectors	
89			Tool center point management (TCPM)	
90			Keeping the tool normal to the contour	
91			Tool radius compensation normal to the tool direction	
92		- Interpolation	Line in 5 axes (subject to export permit)	
93			Spline: execution of splines (3rd degree polynomial)	

NC Unit Specifications



Standard Optional X N/A

NO.	Description		Spec.	S840Dsl
1	AXES CONTROL	Controlled axes	3 axes	X
2			4 axes	X
3			5 axes	X, Y, Z, C, A
4		Simultaneously controlled axes	Positioning(G00)/Linear interpolation(G01) : 3 axes Circular interpolation(G02, G03) : 2 axes	X
5			Positioning(G00)/Linear interpolation(G01) : 4 axes Circular interpolation(G02, G03) : 2 axes	X
6		Least command increment	0.001mm (0.0001 inch)	
7		Least input increment	0.001mm (0.0001 inch)	X
8		Maximum commandable value	±99999.999mm (±3937 inch)	
9	INTERPOLATION & FEED FUNCTIONS	Reference point return		
10		Inverse time feedrate	G93	
11		Spline interpolation (A, B and C splines)		
12	SPINDLE FUNCTIONS	Retraction for rigid tapping		
13		Rigid tapping		
14	TOOL FUNCTIONS	Tool radius compensations in plane		
15		• With approach and retract strategies		
16		• With transition circle / ellipse on outer edges		
17		Number of tools / cutting edges in tool list	256 / 512	X
18		Tool length compensation		
19		Tool offset selection via T and D numbers		
20		Replacement tools for tool management		
21		Monitoring of tool life and workpiece count		
22	PROGRAMMING & EDITING FUNCTIONS	Main program call from main program and subroutine		
23		Subroutine levels and interrupt routines, max.		16 / 2
24		Number of subroutine passes <= 9999		
25		Number of levels for skip blocks 1		
26		Number of levels for skip blocks 8		
27		Polar coordinates		
28		Auxiliary function output		
29		• Via M word, max. programmable value range: INT 231-1		
30		• Via H word, max. range: REAL ± 3.4028 ex 38/ INT -231 ... 231-1		
31		High-level CNC language with		
32		• User variables, configurable		
33		• Read/write system variables		
34		• Indirect programming		
35		• Program jumps and branches		
36		• Arithmetic and trigonometric functions		
37		• Compare operations and logic combinations		
38		• Macro techniques		
39		• Control structures IF-ELSE-ENDIF		
40		• Control structures WHILE, FOR, REPEAT, LOOP		
41		• STRING functions		
42		Program functions		
43		• Dynamic preprocessing memory FIFO		
44		• Look ahead number of blocks		150
45		• Frame concept		
46		• Inclined-surface machining with swivel cycle		
47		Online ISO dialect interpreter		

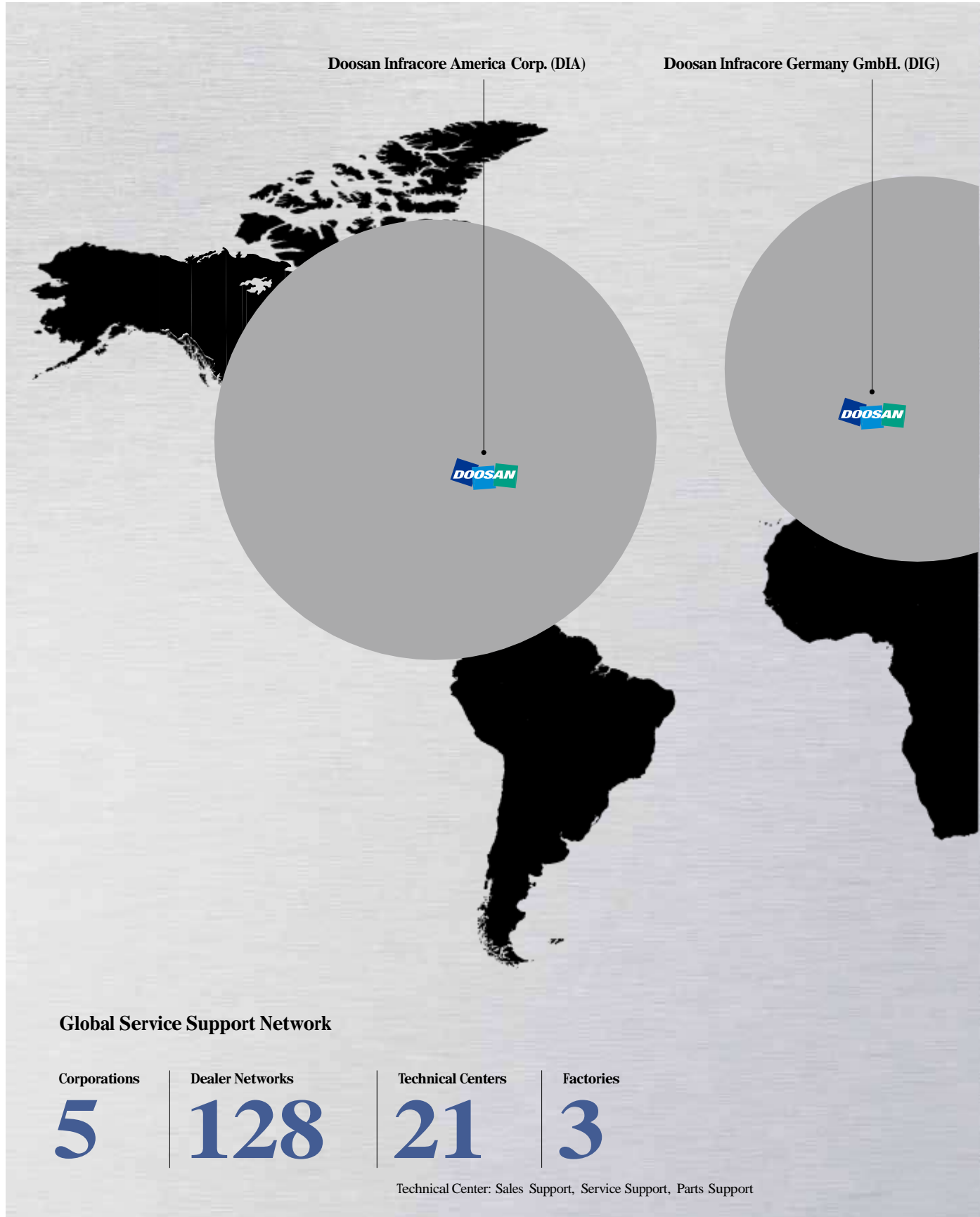
NC Unit Specifications

☂ Standard ☂ Optional X N/A

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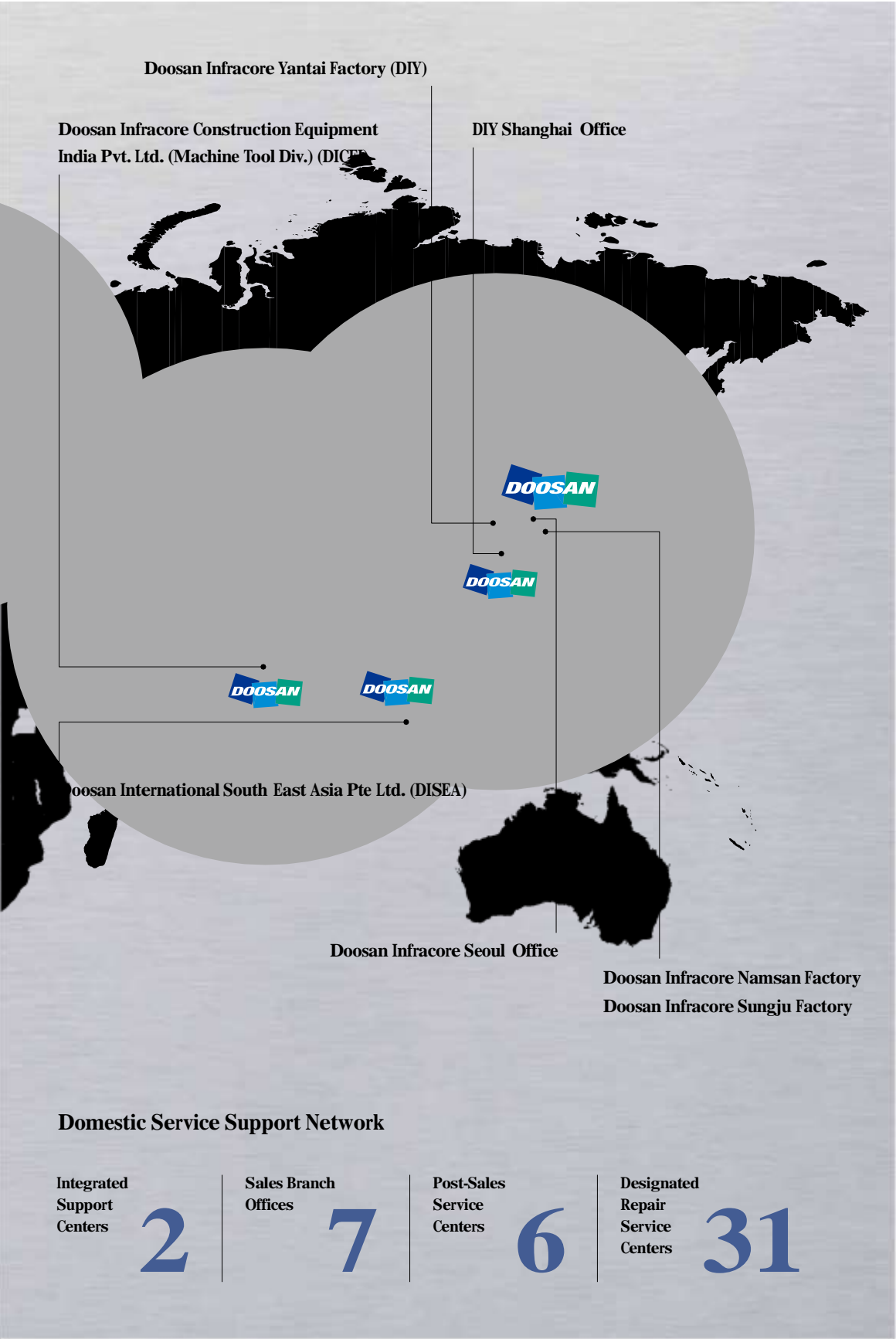
NO.		Description	Spec.	S840Dsl
48	PROGRAMMING & EDITING FUNCTIONS	Program / workpiece management		
49		• Parts programs on NCU, max. number		1000
50		• Workpieces on NCU, max. number		250
51		• On additional plug-in CF card		☂
52		• On USB storage medium (e.g. disk drive, USB stick)		☂
53		• On network drive		☂
54		Basic frames, max. number		16
55		Settable offsets, max. number		100
56		Program editor		
57		• Programming support for cycles program (Program Guide)		☂
58		• CNC editor with editing functions: Marking, copying, deleting		☂
59		• Programming graphics / free contour input (contour calculator)		☂
60		Technology cycles for drilling / milling		☂
61		Pocket milling free contour and islands stock removal cycle		☂
62		Residual material detection		☂
63		Access protection for cycles		☂
64		Programming support can be extended, e.g. customer cycles		☂
65		2D simulation		☂
66		3D simulation, finished part		☂
67		Simultaneous recording		☂
68	OTHERS FUNCTIONS (Operation, setting & Display, etc)	JOG		
69		• Handwheel selection		☂
70		• Switchover: inch / metric		☂
71		Automatic		
72		• Execution from USB or CF card interface on operator panel front		☂
73		• Execution from network drive		☂
74		• DRF offset		☂
75		• Block search with / without calculation		☂
76		Preset		
77		• Set actual value		☂
78		10.4" color display		X
79		15.0" color display		☂
80		Plain text display of user variables		☂
81		Operating software languages		
82		• Ch_S, Ch_T, En, Fr, Gr, It, Kr, Pt, Sp		☂
83		• Additional languages, use of language extensions		☂
84		Working area limitation		☂
85		Limit switch monitoring		☂
86		Software and hardware limit switches		☂
87		Remote Control System (RCS) remote diagnostics		
88		• RCS Host remote diagnostics function		☂
89		• RCS Commander (viewer function)		☂
90		Integrated service planner for the monitoring of service intervals		☂
91		Automatic measuring cycles		☂
92		Easy Extend		X
93		TRANSMIT / cylinder surface transformation		☂
94		Contour handwheel		☂
95		Integrate screens in SINUMERIK Operate with SINUMERIK Integrate Run MyScreens		☂
96		Cross-mode actions (ASUPs and synchronized actions in all operating modes)		☂

Responding to Customers Anytime, Anywhere



Doosan Machine Tools' Global Network, Responding to Customer's Needs nearby, Anytime, Anywhere

Doosan machine tools provides a system-based professional support service before and after the machine tool sale by responding quickly and efficiently to customers' demands. By supplying spare parts, product training, field service and technical support, we can provide top class support to our customers around the world.



Customer Support Service

We help customers to achieve success by providing a variety of professional services from pre-sales consultancy to post-sales support.

Supplying Parts



- Supplying a wide range of original Doosan spare parts
- Parts repair service

Field Services



- On site service
- Machine installation and testing
- Scheduled preventive maintenance
- Machine repair

Technical Support



- Supports machining methods and technology
- Responds to technical queries
- Provides technical consultancy

Training



- Programming / machine setup and operation
- Electrical and mechanical maintenance
- Applications engineering

Major Specifications

VC 630/5AX



Specification	UNIT	VC 630/5AX	VC 630/5AX with APC
Max. spindle speed	r/min		12000
Spindle motor power	kW (Hp)	FANUC : 22 / 18.5 (29.5 / 24.8)	
Tool shank	Taper	ISO#40 7/24	
Travels (X, Y, Z)	mm (inch)	650 / 765 / 520 (25.6 / 30.1 / 20.5)	
Number of tools	ea	40	
Table size	mm (inch)	Ø630 (Ø23.6)	500 x 500 (19.7 x 19.7)
Travels (A, C)	deg	A-axis : 150 , C-axis : 360	
NC system	-	FANUC 31i-5	



Doosan Machine Tools

<http://www.doosanmachinetools.com>

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Optimal Solutions for the Future

Head Office

Doosan Tower 20th FL., 275, Jangchungdan-Ro
(St), Jung-Gu, Seoul
Tel +82-2-3398-8693 / 8671 / 8680
Fax +82-2-3398-8699

Doosan Infracore America Corp.

19A Chapin Rd., Pine Brook, NJ 07058, U.S.A.
Tel +1-973-618-2500
Fax +1-973-618-2501

Doosan Infracore Germany GmbH

Emdener Strasse 24, D-41540 Dormagen,
Germany
Tel +49-2133-5067-100
Fax +49-2133-5067-001

Doosan Infracore Yantai Co., LTD

13 Building, 140 Tianlin Road, Xuhui District,
Shanghai, China (200233)
Tel +86-21-6440-3384 (808, 805)
Fax +86-21-6440-3389

Doosan Infracore Construction Equipment India Pvt. Ltd. (Machine Tool Div.)

106 / 10-11-12, Amruthahalli, Byatarayanapura,
Bellary road, Bangalore-560 092, India
Tel +91-80-4266-0122 / 121 / 100

Doosan International South East Asia Pte Ltd.

42 Benoi Road, Jurong 629903, Singapore
Tel +65-6499-0200
Fax +65-6861-3459



■ For more details, please contact Doosan.

■ The specifications and information above-mentioned may be changed without prior notice.